

Whiplash Form - Operational Definitions / Instructions

Examined/Treated By: Select the person(s) who performed/guided most of the exam/treatment for this patient. If there was equal contribution from the clinician and the student PT, click “both”.

Total Duration Symptoms: Put findings in years. If <1 year, you can enter months, but write out the word “months”. This value should represent the total period of time this patient has experienced similar symptoms, not just the current episode.

Height/Weight: Needed information for calculating BMI. Please be sure to fill this out.

Location of symptoms: Check all areas that apply

Other signs/sxs/conditions: Check all other regions/conditions that apply for this patient, even if it is felt that the symptoms/signs/conditions are not relevant to the patient’s complaint.

Duration (current symptoms): Enter your value in days for this episode of symptoms.

Post-surgical: Check yes only if the patient has had surgery to

his/her head/neck. **PHYSICAL EXAM**

Upper Limb Tension Test: The upper limb tension test (ULTT) is performed with the patient supine. The examiner sequentially introduces the following movements to the symptomatic upper extremity: 1) scapular depression, 2) shoulder abduction to about 90° with the elbow flexed, 3) forearm supination, wrist and finger extension, 4) shoulder lateral rotation, 5) elbow extension, and 6) contralateral then ipsilateral cervical side-bending. A positive test occurs when any one of the following findings are present: 1) reproduction of all or part of the patient’s symptoms, 2) side-to-side differences of > 10° of elbow extension or wrist extension, or 3) on the symptomatic side, contralateral cervical side-bending increases the patient’s symptoms, or ipsilateral side-bending decreases the patient’s symptoms.

Spurling’s Test: The patient is seated and is asked to side bend and slightly rotate the head to the painful side while the examiner places a compression force of approximately 7 kg through the top of the head in an effort to further narrow the intervertebral foramen . The test is



considered positive when it reproduces the patient’s symptoms. You can check “not indicated” if the patient has no upper extremity or scapular region symptoms.

Distraction Test: The Distraction test is also used to identify cervical radiculopathy and is performed with the patient supine. The examiner grasps under the chin and occiput, flexes the patient’s neck to a position of comfort, and gradually applies a distraction force of up to approximately 14 kg. A positive test occurs with the diminution or elimination of the patient’s symptoms. You can check “not indicated” if the patient has no upper extremity or scapular region symptoms.



Cervical Rotation < 60°: If ipsilateral neck rotation is < 60 degrees, check positive

Cranial Cervical Flexion Test (CCFT) This is a test of the anatomical action of the longus capitis/collis musculature. The test is performed in a supine, hook-lying position. A pressure device is placed under the suboccipital region. A towel roll is used to ensure that the head and neck are in mid-range (an imaginary line between the forehead and the chin should be parallel to the treatment table). Once positioned, the pressure device should be inflated until there is 20 mmHg. Patient is instructed to “gently nod the head as though you were saying “yes”. While the patient is performing the test movement, the therapist should be monitoring unwanted activation of the superficial muscles of the anterior neck via palpation. Pressure should increase from 20-22 mmHg and maintained for 5 seconds. Have the patient repeat the test movement up to “X” number of repetitions (no more than 10). Repeat for each successive level of mmHg, starting from 20 mmHg. **Only proceed to the level in which the patient can comfortably achieve. Attempting to reach 30 mmHg is NOT required and lack of ability to achieve should not be considered abnormal. EDUCATE THE PATIENT ON CORRECT PATTERN!**



An abnormal response could be observed based on:

- 1) unable to generate an increase in pressure,
- 2) unable to hold the generated pressure over time (variable pressure readings),
- 3) use of superficial neck muscles (variable pressure readings), or
- 4) sudden movement of the chin or pushing of the neck forcefully against the pressure device (e.g. chin retraction and abrupt increase in pressure > 30 mmHg).

- if any level provokes pain, discontinue performance of test.

Scoring:

Activation Score: Pressure level able to be achieved and held for 5 sec

Performance Index: Increase in Pressure × number of repetitions

*Note: If the equipment is not available to perform this test check “unable to perform”.

Signs of Neuromechanosensitivity (NMS): When assessing DNF activation, the PT should assess for signs of NMS. The PT should passively assess CCF and then ask the patient to perform a single straight-leg raise of approximately 5-10 degrees. An increase in neck pain is considered positive. Repeat on the other leg. Next, the PT should have the patient place their upper extremity into a position of upper limb tension and the PT should then assess for an increase in neck/arm pain during passive CCF. Repeat on the other arm. Reproduction of painful symptoms during one or all of the maneuvers should be considered positive for signs of NMS. **Treatment including DNF therapeutic exercise should be performed with the pt in the supine, hook-lying position with knees bent and arms folded across chest.**

Cervical Joint Position Error (JPE): The test is performed in a supine, hook-lying position. The PT asks the patient to close his/her eyes and then passively rotates the pt’s head/neck to the right. The pt is then instructed to turn their head back to a ‘straight’ position with eyes closed. Observe the pt’s pattern of returning to ‘straight’ and then observe their end position. If the patient nominates a position of ‘error’ as being ‘straight’, the PT should then passively position the patient’s head/neck to ‘straight’ and ask the patient as to what that position feels like. Document whether the patient had a difficult time returning to a normal ‘straight’ position and whether they felt as if a ‘straight’ position felt ‘off.’ This test could indicate abnormal afferent input from the upper cervical tissues e.g. joints, muscles. Repeat to the left as well.

Deep Neck Flexor Endurance: The test is performed in a supine, hook-lying position. With the chin maximally retracted and maintained isometrically, the patient lifts the head and neck until the head is approximately 2.5 cm (1 in) above the plinth while keeping the chin retracted to the chest. The clinician focuses on the skin folds along the patient’s neck and places his/her left hand on the table just below the occipital bone of the patient’s head. Verbal commands (ie, “Tuck your chin” or “Hold your head up”) are given when either the skin fold(s) began to separate or the patient’s head touched the clinician’s hand. The test is terminated if the skin fold(s) is separated due to loss of chin tuck or the patient’s head touches the clinician’s hand for more than 1 second.

Posture: Observe the patient’s upper thoracic spine is an upright sitting posture. Check if the patient has a “flat” upper thoracic spine, or if there is increased kyphosis in the upper thoracic spine. If normal posture, check “normal”.



Cervical Active Range of Motion

All cervical ROM measures are performed in the upright sitting position. Care should be taken to insure the patient maintains an upright sitting position throughout the examination and during subsequent follow-up examinations. The following procedures are used to measure the range of motion for the cervical spine.

1. Neck Flexion/Extension - For neck flexion, the inclinometer is placed on the top of the patient’s head aligned with the external auditory meatus and then zero’ed. The patient is asked to flex the head forward as far as possible, bringing the chin to the chest. The amount of neck flexion is recorded from the inclinometer. For extension ROM, the inclinometer is positioned in the same manner, and the patient is asked to extend the neck backwards as far as possible. The amount of neck extension is recorded with the inclinometer.
2. Neck Side -Bending - The inclinometer is positioned in the frontal plane on the top of the patient’s head in alignment with the external auditory meatus. To measure right side-bending, the patient is asked to move the right ear to the right shoulder. The amount of side-bending is recorded with the inclinometer. The opposite is performed to measure left side-bending. Care should be taken to avoid concomitant rotation or flexion with the side-bending movement.
3. Neck Rotation –Rotation can be measured with a universal / standard goniometer. The patient is seated, looking directly forward with the neck a neutral position. The fulcrum of the goniometer is placed over the top of the head with the stationary arm aligned with the acromion process, and the moveable arm bisecting the patient’s nose. The patient is asked to rotate in each direction as far as possible. Similar to extension, cervical rotation may produce dizziness or nausea in patients with VBI.
4. Patient is then instructed to place their tongue on the roof of their mouth and again complete CROM. Patient is considered to have increased ROM if: they have increased ROM in any/all directions and the subjective reports are that the motion is ‘easier.’



Centralizes: If you are able to centralize symptoms with either patient positioning or with repeated motions, check

“centralizes”. If you are unable to centralize symptoms in the exam, check “cannot centralize”. If the patient has no upper extremity or scapular region symptoms, check “not applicable”. Note that centralization means that a movement, repeated movement, or position causes the pain and/or paresthesia to move from a distal to a more proximal area.

NEUROLOGICAL EXAMINATION

Note: You may check “not indicated” for dermatomes/myotomes/reflexes if the patient has no symptoms extending beyond the deltoid insertions bilaterally

Dermatomes: Sensation is tested over key areas of dermatomes C2-T1 on each neck, shoulder girdle and limb. After each area is tested, the patient is asked; “Does that feel the same to you on each side?” If a difference is noted, the area should be explored further to map the extent of the sensory deficit. Results are recorded as normal or abnormal compared to the non-involved side. If a neuro exam is not indicated, check “not indicated”.

Reflexes: The biceps brachii reflex tests the C5 nerve root. The reflex is tested by placing the patient’s arm in about 45° of flexion with the muscle relaxed. The examiner strikes the tendon in the cubital fossa, just proximal to its insertion. The thumb may be placed over the tendon to insure proper technique. The brachioradialis reflex primarily tests the C6 nerve root. The arm is positioned as for the biceps reflex. The examiner strikes the tendon at the distal aspect of the radius with the flat edge of the reflex hammer. The triceps reflex is used to test the C7 nerve root. The examiner supports the patient’s arm and strikes the triceps tendon just proximal to the olecranon. Each reflex is graded as Normal, Decreased, or Increased.

Myotomes: Key muscles for each cervical nerve root (C5-T1) are tested. Each muscle test is graded as WNL or diminished. The examiner should also note if pain was produced during the muscle test. Muscle testing procedures are outlined in the table below.

Key Muscles for MMT	Dermatomal areas	Key Muscle for MSRs
C5 deltoid (shoulder in 90° abduction, resistance against lateral upper arm into adduction)	Mid-deltoid	biceps brachii (C5, C6) brachioradialis (C5, C6)
C6 <u>biceps brachii</u> (elbow at 90° flexion with forearm supinated, resistance against lower forearm into extension) <u>extensor carpi radialis longus/brevis</u> (wrist extended/ radially deviated with forearm pronated, resistance against dorsum of hand into flexion/ulnar deviation)	radial aspect of 2 nd metacarpal/ digit	
C7 <u>triceps</u> (arm is placed overhead with elbow slightly flexed, resistance against forearm into flexion) <u>flexor carpi radialis</u> (wrist flexed/radially deviated with forearm supinated, resistance against thenar eminence into extension/ulnar deviation)	dorsum of 3 rd finger	triceps (C7)
C8 <u>abductor pollicis brevis</u> (thumb placed in abduction, resistance against proximal phalanx into adduction)	medial aspect of 5 th finger	N/A
T1 <u>first dorsal interossei</u> (index and middle finger are separated, resistance against the medial aspect of proximal phalanx of the index finger into adduction)	medial forearm	N/A

*** The nerve root in bold is the primary nerve root assessed by the MSR.

Balance Assessments:

Routine for Diagnosis: Ask the PT whether he/she routinely examines balance in an individual with this diagnosis.

Degree of Patient perceived balance problem: Ask the patient, “On a scale of 0-10, where 0 is no balance difficulties, and 10 would be balance problems so severe you could not stand, where would you place your balance abilities?”

Single Limb Stance Test: Eyes Open (EO)—patient selects stance leg

Instructions to patient:

Lift your right/left leg from the floor by bending your knee; stay standing on one leg as long as you can. Keep your arms across your chest and don't touch your raised leg against your other leg. Hold this position until I tell you to stop. (max of 30 sec)

Standing on one leg/ Eyes Closed (EC)

Instructions to patient:

Lift your right/left leg from the floor by bending your knee; stay standing on one leg as long as you can. Keep your arms across your chest and don't touch your raised leg against your other leg. Close your eyes and hold this position until I tell you to stop. (max of 30 sec)

Examiner instructions:

Subject will stand with eyes open (prior to eyes closed) on a flat surface with no external support. Timing will begin when one foot is raised off the floor. Allow the patient two attempts and record the best time. Record number of seconds the person can hold this posture up to a maximum of 30 seconds. Stop timing when the subject moves their hands from chest, touches foot against stance leg, moves stance foot around, or touches foot/toe down. Subject is allowed to use preferred stance leg for test. Allow two attempts and record the best trial for each condition.

Strategy: record your assessment of ankle sway strategy/ hip strategy

Tandem Stance -EO (Sharpened Romberg)

Instructions to patient:

Place one foot directly in front of the other so that the toes of one foot are touching the heel of the other. Place your arms across your chest. Stand like this until I tell you to stop (max 30 sec).

Tandem Stance -EC

Instructions to patient:

Place one foot directly in front of the other so that the toes of one foot are touching the heel of the other. Place your arms across your chest and close your eyes. Stand like this until I tell you to stop (max 30 sec).

Examiner instructions:

Do the tests in order (EO then EC). Record the time the patient was able to stand in each condition up to a maximum of 30 seconds and average both times. If patient is unable to assume tandem stance position, record as unable.

Forward Reach

Instructions to patient:

Stand normally. Lift your arm straight in front of you. Stretch your fingers and reach forward as far as you can. Please do not touch the ruler. Once you have reached as far forward as you can, return to a normal standing position. I will ask you to do this twice. Do not lift your heels from the floor.

Examiner instructions:

Place a ruler at shoulder height at the end of the fingertips when the arm is out at 90 degrees. The fingers should not make contact with the ruler. The patient may not lift heels, rotate trunk, or protract scapula excessively. The patient must keep their arm parallel to ruler and may use the less involved arm. The recorded measure is the maximum horizontal distance reached by the patient. Record best reach and strategy used (ankle or hip).

Walking VOR Test- with horizontal head turns

Instructions to patient:

Begin walking at your normal speed, when I say "right", turn your head and look to the right; when I say "left" turn your head and look to the left. Try to keep yourself walking in a straight line.

Examiner instructions:

Allow the patient to reach their normal gait speed, and call the commands, "right, left" every 3-5 steps. Record the most appropriate score:

(3) Normal, performs head turns smoothly with no change in gait.

(2) Mild, performs head turns smoothly with slight change in gait speed, minor disruption to smooth gait path, veering right or left.

(1) Moderate, performs head turns, but slows down OR staggers, but recovers and continues to walk.

(0) Severe impairment, performs task with severe disruption of gait, OR staggers outside a 15" path, loses balance, stops, reaches for assistance and needs assistance to prevent a fall.

To grade: mark the lowest category that applies.

Balance Problem Identified? Mark Yes or No, by your or PT's assessment.

Balance Problem Treated? Make Yes or No, whether you/PT believe treatment was oriented to improving balance.